

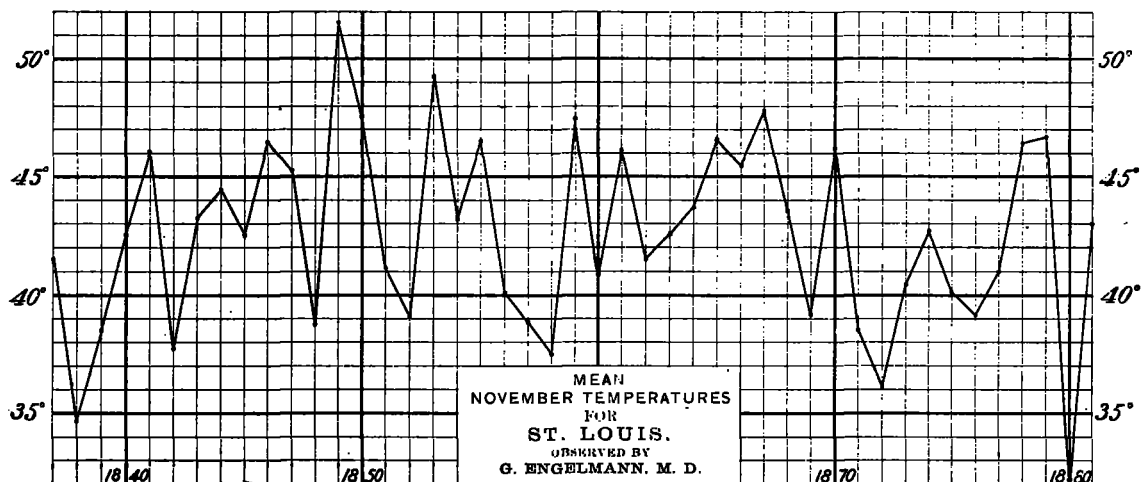
27° N., 127° 18' E., 30.08, NNW., heavy gale, high sea; Hiroshima, 29.76, a fall of 0.28 inch, wind shifted from NNE to SW., gloomy weather; Tokei, 29.87 a fall of 0.29 inch, wind shifted from NNE. to NNW., cloudy, 0.88 inch rainfall in past 24 hours; Wakayama, 29.73, a fall of 0.29 inch, wind shifted from NE. to SE. 7th, depression probably central off the northeastern coast of the Island of Nippon; lowest barometer at Tokei, 29.60, a fall of 0.27 inch, SW., clear; Yokohama, 29.65, a fall of 0.27 inch, W., clear; Wakayama, 29.84, W., clear; Hiroshima, 29.88, W., rain; Nagasaki, 30.10, W., rain. During the day the depression disappeared to the eastward over the ocean, followed morning of the 8th by clear weather and rising pressure at all stations. No. XV.—On the 14th the barometer at Nagasaki fell from 0.15 to 0.20 inch, followed on the morning of the 15th by winds shifting from W. to NW., with heavy rain. The pressure at most Japanese stations had fallen from 0.10 to 0.15 inch, with northeasterly winds. 16th, depression probably central off the southeastern coast of Nippon; Tokei, 29.72, a fall of 0.37 inch, NW., rain, 1.73 inches rainfall in past 24 hours; at other Japanese stations the barometer rose from 0.01 to 0.23 inch, with clearing weather and winds shifting to northwesterly. This depression was too far south of the coast to produce decided effect at land stations. No. XXII.—On the 18th, the barometer at all Japanese stations fell from 0.06 to 0.21 inch, followed on the 19th by winds shifting to easterly, with cloudy weather and rain. By morning of the 20th the depression passed eastward south of Tokei, the barometer at that station having fallen 0.24 inch, wind shifting from NE. to NNW., with clearing weather. The barometer at other stations, except Wakayama, rose from 0.07 to 0.11 inch, with winds shifting to northeasterly. No. XXIII.—The presence of this depression to the southwestward was forestalled on the 20th at western stations by the shifting of the winds from northwest to northeast, with slowly rising pressure, while at Wakayama, Yokohama and Tokei (eastern stations) the winds shifted from northeast to northwest, with falling pressure under the influence of departing area No. XXII. By morning of the 21st the barometer at all Japanese stations had fallen from 0.02 to 0.12 inch, with northeast to northwest winds and light rain at Nagasaki. 22nd, lowest barometer at Tokei, 29.69, a fall of but 0.01 inch, NNW., clear. Nagasaki remained stationary, while the barometer at other stations fell from 0.03 to 0.04 inch; the winds at all stations shifted to northerly, with clear or fair weather. By morning of the 23d the barometer at all stations, except Nagasaki, had risen from 0.04 to 0.10 inch, with winds shifting to northwesterly; the probable position of the area was indicated by the following ships report: in 37° 10' N., 161° 32' E., 29.54, NW., force 4 to 6, high westerly gales, heavy sea and rain. This depression was too far south to produce decided effect at land stations. No. XXVIII.—The position of this depression as charted on the 23d is very much in doubt, although the southeasterly winds, with falling pressure at Manilla would probably indicate its presence south of the Island of Formosa. By morning of the 24th the barometer at Nagasaki had fallen slightly, wind changed from WNW. to calm. At Hiroshima the barometer fell 0.02 inch, wind NNE., clear; Tokei, rose 0.04 inch, wind shifted from NNW. to NE.; Wakayama, rose 0.01 inch, wind continued from the E. 25th, Hiroshima, barometer stationary, wind shifted from NNE. to NNW, light rain; Nagasaki, rose 0.08 inch, wind N.; Tokei, 29.55, a fall of 0.38 inch, wind shifted from NE. to SSW.; Wakayama, fell 0.16 inch, wind shifted from E. to NNW, light rain. By morning of the 26th, the barometer at Japanese stations had risen from 0.15 to 0.53 inch, winds shifting to northeasterly, with clear or fair weather. On this day the depression was probably central in about 37° N., 150° E., as shown by the following ship's report: in 35° 50' N., 150° 24' E., 29.35, SSW., force 7, high southwesterly sea, heavy rain. This vessel, on the 25th, in 36° 10' N., 154° 57' E., reported a barometer of 30.08, wind SW., force 4; in moving east about 4° she experienced a fall in pressure 0.73 inch, with wind increasing to a gale. The probable position of the depression on the 27th is again indicated by the ship's report as follows: in 35° 48' N., 148° 09' E., 29.48, N., force 9, high north sea, heavy rain. 28th, in 25° 22' N., 145° 55' E., 29.85, N., force 6, high NNW. sea, heavy rain. No. XXXIII.—By morning of the 28th the barometer at Nagasaki had fallen from 30.09 to 29.86, wind shifted from SE. to WNW., with light rain. At Hiroshima the barometer had fallen 0.43 inch, wind shifted from NNE. to ESE., with rain; Tokei, fell 0.23 inch, wind shifted from ESE. to NNE., with moderately heavy rain; Wakayama, fell 0.48 inch, wind shifted from NNW. to E., with moderately heavy rain. 29th, Tokei, 29.34, a fall of 0.65 inch, SSE., cloudy; Wakayama, 29.56, a fall of 0.16 inch, NW., fair; Hiroshima, 29.73, a fall of 0.03 inch, W., cloudy; Nagasaki, 29.97, a rise of 0.11 inch, NW., cloudy; in 34° 53' N., 142° 55' E., 29.41, SSW., force 6, high west sea, cloudy. 30th, Tokei, 29.32, a fall of 0.02 inch, SW., clear; Wakayama, 29.67, a rise of 0.11 inch, WNW., cloudy; Hiroshima, 29.81, a rise of 0.08 inch, WNW., cloudy; Nagasaki, 29.98, a rise of 0.01 inch, WNW., rain; in 35° 02' N., 140° 42' E., 29.30, WNW., force 6, high west sea, rain squalls. 31st, the barometer at all Japanese stations rose from 0.11 to 0.24 inch, winds shifted from SW. and WNW. to N. and NNE., with clear or partly cloudy weather; lowest barometer at Yokohama, 29.42, rising on the following day to 29.90, wind W. During the day the depression disappeared to the eastward over the ocean.

### TEMPERATURE OF THE AIR.

The mean temperature of the air for November, 1881, is shown by the isothermal lines (in red) on chart No. II. The table of mean and comparative temperatures in the right hand corner of the chart shows, in the first column, the average for the month through-

out the various districts, as deduced principally from observations taken at Signal Service stations. In the two remaining columns are shown the means for the present month, and the departures of such means from the average for many years. East of the 97th meridian the temperature is everywhere above the normal, except in Minnesota and the Western Gulf states, the departures of excess ranging in the extremes from  $0^{\circ}.7$  in the Missouri valley to  $5^{\circ}.6$  in the Florida peninsula. The Western Gulf states report a normal condition, while Minnesota shows a deficiency of  $1^{\circ}.1$ . Westward to the Pacific the temperature is everywhere below the normal, except in the Northern Rocky Mountain slope, where there is an excess of  $0^{\circ}.7$ . Throughout this extensive stretch of territory the departures of deficiency range in the extremes from  $0^{\circ}.4$  in the Middle Rocky Mountain slope to  $2^{\circ}.4$  in the Middle Pacific coast region. Larger deficiencies were reported from isolated stations,  $4^{\circ}.5$  at Salt Lake City and  $3^{\circ}.1$  on the summit of Pike's Peak. As a means of interesting comparison, the following maximum departures from the normal are given for each year since 1872, together with the corresponding districts: 1873,  $-7^{\circ}.0$  New England and  $-5^{\circ}.5$  Minnesota; 1874,  $+42.8$  Gulf states and  $+3^{\circ}.9$  Ohio valley and Tennessee; 1875,  $-6^{\circ}.0$  St. Lawrence valley,  $-5^{\circ}.3$  Minnesota and  $+5^{\circ}.7$  Gulf states; 1876,  $-4^{\circ}.5$  Lower Missouri valley, and  $+3^{\circ}.1$  Lower Lake region; 1877,  $+7^{\circ}.3$  Minnesota, and  $+6^{\circ}.1$  New England; 1878,  $+13^{\circ}.7$  Upper Missouri valley, and  $+12^{\circ}.4$  Minnesota; 1879,  $+5^{\circ}.1$  Western Gulf states and  $+4^{\circ}.6$  Ohio valley and Tennessee; 1880,  $-12^{\circ}.4$  Rio Grande valley and  $-11^{\circ}.8$  Southeast Rocky Mountain slope.

*Deviations from Mean Temperature.*—Under this heading departures exhibited by reports from the regular Signal Service stations are shown in the table of comparative temperatures on the right-hand side of chart No. II. The following items of importance in connection with this subject are reported by voluntary observers: *Illinois*: Riley, mean temperature  $0.5^{\circ}$  above that for the past 20 years; mean temperature of autumn of 1881,  $3^{\circ}.5$  higher than the average of this season for the past 20 years; only the years 1865 and 1870 were warmer than 1881, while the mean of 1867 was just equal. *Kansas*: Lawrence, mean temperature  $1^{\circ}.56$  above the mean of past 13 years. Yates Centre, mean temperature  $11^{\circ}.5$  above that of 1880. Wellington, mean temperature  $3^{\circ}.05$  above the average for past two years. *Maine*: Gardiner, mean temperature  $1^{\circ}.52$  above the mean of the past 45 years. *Maryland*: Fallston, mean temperature  $4^{\circ}.8$  above the mean of the past 10 years. *Missouri*: St. Louis, Missouri Weather Service reports the mean



temperature  $0^{\circ}.4$  above the mean of the past 45 years. *New Hampshire*: Contoocookville, mean temperature  $38^{\circ}.5$  or  $4^{\circ}.5$  above the mean of past 10 years. *New Jersey*: Newark, mean temperature  $2^{\circ}.73$  above the average for the past 38 years; highest mean,  $49^{\circ}.7$  in 1849; lowest mean,  $36^{\circ}.1$  1873; mean temperature of autumn  $5^{\circ}.3$  above the average of past 38 years; warmest autumn  $56^{\circ}.32$  occurred in 1850; coldest autumn  $50^{\circ}.77$  occurred in 1875. *New York*: North Volney, mean temperature  $2^{\circ}.8$  above that of the past 13 years; highest monthly mean,  $38^{\circ}.8$  occurred in 1877; the lowest,  $29^{\circ}.5$  occurred in 1873; mean temperature of autumn  $4^{\circ}.54$  above the mean of this season for past 13 years; the autumn of 1881 has been the warmest on record. Palermo, mean temperature  $1^{\circ}.3$  below that of the past 28 years; warmest November, temperature  $41^{\circ}.8$  occurred in 1859; coldest November, temperature  $26^{\circ}.8$  occurred in 1873. Waterburg, mean temperature,  $4^{\circ}.61$  above the mean of the past 10 years. *Ohio*: North Lewisburg, mean temperature  $12^{\circ}.5$  above that of 1880 and  $2^{\circ}.6$  above the mean of the past 50 years. Cleveland, mean temperature  $11^{\circ}.27$  above that for 1880 and  $2^{\circ}.6$  above the mean of the past 27 years; highest mean during that period  $44^{\circ}.53$  occurred in 1859; lowest mean  $31^{\circ}.91$  occurred in 1880. *Virginia*: Wytheville, the following report is made by Mr. Howard Shriver, voluntary observer: "like the four preceding months, November has been warmer than the average. Not

only so, but its average temperature has been higher and it may hence be regarded as a warmer month than any November in the past 17 years, by values varying from 1° to 9°. As might be expected, its warmest day showed a higher marking than any day of the previous 17 Novembers, with one exception, in the year 1879, when the mercury rose 6° higher than any day of the present month. It seems strange, in this connection, to find that only three (1872, 1873 and 1879) of the preceding Novembers had colder days than the present month." *West Virginia: Helvetia*, mean temperature 9°.11 above that for 1880 and 4°.01 above the mean of the past 5 years.

*Table of Maximum and Minimum Temperatures for November, 1881.*

State or Territory.	Signal Service.			U. S. Army Post Surgeons or Voluntary Observers.			State or Territory.	Signal Service.			U. S. Army Post Surgeons or Voluntary Observers.		
	Station.	Max.	Min.	Station.	Max.	Min.		Station.	Max.	Min.	Station.	Max.	Min.
Alabama.....	Mobile.....	81°		Auburn.....		18°	Minnesota.....	St. Paul.....	57°		Northfield.....	56°	
Do.....	Montgomery.....		25°				Do.....	St. Vincent.....		-15°			
Arizona.....	Yuma.....	53°		Maricopa.....	96°		Mississippi.....	Vicksburg.....	50°	25°	Fayette.....		22°
Do.....	Prescott.....		12°				Missouri.....	St. Louis.....	72°	15°	Sedalia.....	76°	
Arkansas.....	Little Rock.....	71°	25°	Mt. Ida.....	80°	16°	Do.....				Oregon.....		4°
California.....	Campano.....	75°	16°	Indio.....	85°		Montana.....	Ft. Benton.....	63°		Ft. Shaw.....		-19°
Do.....				Summit.....		1°	Do.....	Ft. Assinaboine.....		-15°			
Colorado.....	Denver.....	65°					Do.....	& Ft. Shaw.....		-5°	Lincoln.....	74°	
Do.....	Pike's Peak.....		-12°				Nebraska.....	North Platte.....	67°	5°	Golconda.....	65°	
Connecticut.....	New Haven.....	66°	17°	Southington.....	70°	13°	Nevada.....	Winnemucca.....	61°	5°	Boca.....		-24°
Dakota.....	Ft. Sully.....	68°		Ft. Randall.....	78°		Do.....				Contoocook.....	67°	
Do.....	Ft. Stevens.....		-21°	Ft. Stevenson.....		-22°	New Hampshire.....	Mt. Wash'ton.....	47°	-13°	Vineland.....	78°	
Delaware.....	Breakwater.....	73°	25°				New Jersey.....	Sandy Hook.....	73°		Atco.....		19°
Dist. Columbia.....	Washington.....	76°	21°	Receiving Reservoir.....		20°	Do.....	Atlantic City.....		2°	Fort Union.....		-5°
Florida.....	Key West.....	86°		Ft. Barrancas.....		19°	New Mexico.....	La Mesilla.....	76°				
Do.....	Pensacola.....		25°				Do.....	Silver City.....		13°			
Georgia.....	Augusta.....			Quitman.....		25°	New York.....	Rochester.....	70°		Ft. Niagara.....	71°	
Do.....	Savannah.....	81°					Do.....	Oswego.....		13°	Madison Barracks.....		-2°
Do.....	Atlanta.....		20°				North Carolina.....	Wilmington.....	81°		Highlands.....		8°
Idaho.....	Ft. Lapwai.....	64°					Do.....	Charlotte.....		20°	Portsmouth.....	80°	
Do.....	Eagle Rock.....		-1°				Ohio.....	Columbus.....	72°		Bellefontaine.....		11°
Illinois.....	Champaign.....	72°		Geneseo.....	75°	3°	Do.....	Cleveland.....	72°	15°			
Do.....	Indianapolis.....	63°	10°	Vevay.....	75°		Do.....	Umatilla.....	70°	20°	Dyberry.....		8°
Indiana.....	Ft. Sill.....	75°					Pennsylvania.....	Pittsburg.....	76°				
Indian Ty.....	Ft. Supply.....		12°				Do.....	Erie.....		17°			
Do.....	Keokuk.....	65°		Cresco.....		-1°	Rhode Island.....	New Shoreham.....	70°				
Iowa.....	Davenport.....						Do.....	Newport.....		20°			
Do.....	Dubuque & Des Moines.....		6°				South Carolina.....	Charleston.....	80°	25°	Aiken.....		22°
Do.....	Leavenworth.....	70°	11°	Ft. Scott.....	78°		Tennessee.....	Knoxville.....	81°	15°			
Kansas.....	Louisville.....	74°	19°	Bowling Green.....	75°	15°	Texas.....	Uvalde.....		19°			
Kentucky.....	New Orleans & Port Eads.....	50°		Pt. Pleasant.....	81°		Do.....	Mason.....		13°			
Louisiana.....	Shreveport.....		23°				Utah.....	Salt Lake City.....	56°	13°	Charlotte.....	68°	
Do.....	Portland.....	61°		Dexter.....		-4°	Vermont.....	Burlington.....	65°	3°	Newport.....		-7°
Do.....	Eastport.....		3°				Do.....	Cape Henry.....		24°			
Maryland.....	Baltimore.....	71°	24°	Federalburg & Woodstock.....	77°		Washington Ty.....	Lynchburg.....					
Do.....				Emmitsburg.....		18°	Do.....	Albion and Pomeroy.....	62°				
Do.....	Boston.....	71°		Heath.....		4°	Do.....	Spokane.....		3°	Helvetia.....		14°
Massachusetts.....	Springfield.....		13°	Lansing.....	67°		West Virginia.....	Morgantown.....	76°	26°	Manitowoc.....	63°	
Do.....	Detroit.....	66°		Ft. Brady.....		-3°	Wisconsin.....	La Crosse.....	60°	5°	Neillsville.....		-2°
Michigan.....	Marquette.....		8°				Wyoming.....	Cheyenne.....	56°	9°	Ft. Fetterman.....	63°	
Do.....							Do.....				Ft. Bridger.....		-7°

*Ranges of Temperature at Signal Service stations.*—Monthly ranges in general varied from 45° to 65° over the country east of the Rocky Mountains and from 35° to 55° westward to the Pacific. The *smallest* ranges were: San Francisco, 22°; Key West and Olympia, 25°; Red Bluff, 28°; Portland, Or., 29°; San Diego and Port Eads, 38°; Pike's Peak and Sacramento, 39°. The *largest* were: Rock Creek, Mont., 88°; Ft. Sully, 79°; Ft. Buford, 78°; Forts Stevenson and Benton, 77°; Bismarck, 76°; Ft. Shaw, 75°; Helena, 72°; Fort Assinaboine and Huron, 71°. The *daily* ranges varied in the different districts as follows: New England, 22° at New Shoreham to 34° at Boston and Eastport; Middle Atlantic states, 19° at Albany and 21° at Cape May to 29° at Lynchburg and 31° at Washington; South Atlantic states, 23° at Kittyhawk, Macon, Smithville and Charleston to 30° at Augusta and Jacksonville; Florida peninsula, 12° at Key West to 25° at Cedar Keys; East Gulf states, 21° at New Orleans to 31° at Vicksburg, Mobile, Montgomery and Pensacola; West Gulf states, 21° at Port Eads to 38° at Denison and 39° at Mason; Rio Grande valley, 35° at Laredo, Brackettville and Castroville to 38° at Uvalde; Ohio valley and Tennessee, 23° at Columbus and 24° at Indianapolis to 32° at Knoxville and 38° Nashville; Lower Lake region, 22° at Oswego to 26° at Cleveland, Buffalo and Rochester; Upper Lake region, 20° at Grand Haven and 24° at Port Huron to 30° at Duluth and 31° at Alpena; extreme Northwest, 41° at Moorehead to 48° at Bismarck and 52° at Fort Buford; Upper Mississippi valley, 24° at Keokuk to 33° at St. Louis and 37° at St. Paul; Missouri valley, 31° at Ft. Bennett to 35° at Huron and 43° at Omaha; Southern slope, 36° at Jacksboro' to 46° at McKavett and 47° at Concho; Middle slope, 40° at Dodge City to 42° at Denver; Northern slope, 33° at Cheyenne to 41° at Ft. Keogh and North Platte; Northern plateau, 27° at Boise City to 32° at Missoula and 36° at Eagle Rock; Middle plateau, 25° at Salt Lake City to 36° at Winnemucca; Southern Plateau, 40° at Silver City to 46° at La Mesilla and Phoenix and 48° at Tucson; South

Pacific region, 30° at San Diego to 37° at Yuma and Los Angeles and 39° at Visalia; Middle Pacific region, 15° at San Francisco, to 23° at Sacramento and 34° at Red Bluff; North Pacific region, 18° at Olympia, to 21° at Portland and 22° at Roseburg.

*Table of Comparative Minimum Temperatures for the month of November.*

State or Territory.	Minimum for November, 1881, Signal Service.		Lowest since Signal Service sta- tions were opened—3 to 10 years.			Lowest from any other source.		
	Station	Temp.	Station.	Temp.	Year.	Place.	Temp.	Length of Record.
Alabama.....	Montgomery.....	25°	Montgomery.....	28°	77, '80	Huntsville.....	13°	9 years.
Arizona.....	Prescott.....	13°	Prescott.....	1°	1880	Fort Whipple.....	1°	9 "
Arkansas.....	Little Rock.....	35°	Little Rock.....	10°	1880	Fort Smith.....	6°	21 "
California.....	Campo.....	18°	Campo.....	17°	1880	Fort Bidwell.....	9°	11 "
Colorado.....	Pike's Peak.....	12°	Pike's Peak.....	38°	1880	Fort Garland.....	35°	30 "
Connecticut.....	New Haven.....	17°	New Haven.....	2°	1875	New Haven.....	2°	87 "
Dakota.....	Ft. Stevenson.....	21°	Pembina.....	40°	1874	Colebrook.....	10°	18 "
Delaware.....	Delaware Breakwater.....	26°	Delaware Breakwater.....	23°	1880	Fort Buford.....	37°	16 "
Dist. of Columbia.....	Washington.....	21°	Washington.....	12°	1880	Delaware City.....	13°	4 "
Florida.....	Pensacola.....	25°	St. Marks.....	27°	1877	Washington.....	12°	40 "
Georgia.....	Atlanta.....	20°	Atlanta.....	25°	1880	Ft. Barrancas.....	19°	50 "
Idaho.....	Eagle Rock.....	1°	Lewiston.....	7°	1880	Atlanta.....	10°	7 "
Illinois.....	Champaign.....	11°	Champaign.....	3°	1880	Fort Hall.....	12°	4 "
Indiana.....	Indianapolis.....	10°	Indianapolis.....	5°	1880	Augusta.....	13°	19 "
Indian Territory.....	Ft. Supply.....	12°	Ft. Gibson.....	10°	1880	Indianapolis.....	4°	18 "
Iowa.....	Davenport, Dubuque and Des Moines.....	6°	Dubuque.....	8°	1875	Fort Gibson.....	0°	52 "
Kansas.....	Leavenworth.....	11°	Dodge City.....	7°	1880	Independence.....	17°	18 "
Kentucky.....	Louisville.....	19°	Louisville.....	8°	1880	Fort Leavenworth.....	14°	51 "
Louisiana.....	Shreveport.....	23°	Shreveport.....	18°	1880	Newport Barracks.....	23°	30 "
Maine.....	Eastport.....	3°	Eastport.....	13°	1875	Fort Jessup.....	17°	23 "
Maryland.....	Baltimore.....	24°	Baltimore.....	15°	1880	Orono.....	16°	12 "
Massachusetts.....	Springfield.....	13°	Boston.....	2°	1880	Brunswick.....	3°	53 "
Michigan.....	Marquette.....	8°	Marquette and Escana- naba.....	9°	75, '80	Emmitsburg.....	7°	12 "
Minnesota.....	St. Vincent.....	18°	Duluth.....	29°	1875	Florida.....	14°	4 "
Mississippi.....	Vicksburg.....	25°	Vicksburg.....	23°	77, '80	Fort Brady.....	17°	59 "
Missouri.....	St. Louis.....	18°	St. Louis.....	8°	1880	Fort Ripley.....	30°	17 "
Montana.....	Ft. Assinaboine and Ft. Shaw.....	18°	Ft. Benton.....	31°	1875	Columbus.....	22°	10 "
Nebraska.....	North Platte.....	5°	North Platte.....	10°	1877	North Springfield.....	9°	1 "
Nevada.....	Winnemucca.....	5°	Winnemucca.....	9°	1880	Allenton.....	5°	4 "
New Hampshire.....	Mount Washington.....	16° 6	Mount Washington.....	40°	1877	Jefferson Barracks.....	2°	35 "
New Jersey.....	Atlantic City.....	22°	Atlantic City.....	10°	1875	Camp Baker.....	42°	9 "
New Mexico.....	Silver City.....	13°	Santa Fe.....	11°	1880	Camp Sheridan.....	17°	6 "
New York.....	Oswego.....	13°	Albany.....	10°	1875	Camp Halleck.....	12°	11 "
North Carolina.....	Charlotte.....	20°	Charlotte.....	18°	1880	Grafton.....	16°	2 "
Ohio.....	Cleveland.....	15°	Columbus.....	5°	1880	Dartmouth College.....	9°	18 "
Oregon.....	Umatilla.....	20°	Umatilla.....	9°	1880	North Germantown.....	6°	2 "
Pennsylvania.....	Erie.....	17°	Pittsburg.....	4°	1880	Newark.....	5°	38 "
Rhode Island.....	Newport.....	20°	Newport.....	4°	1875	Fort Union.....	15°	31 "
South Carolina.....	Charleston.....	28°	Charleston.....	3°	77-79, 80	Canton.....	20°	2 "
Tennessee.....	Knoxville.....	15°	Nashville.....	15°	1880	Gouverneur.....	17°	40 "
Texas.....	Mason.....	19°	Fort Elliott.....	5°	1880	Fort Johnson.....	9°	54 "
Utah.....	Salt Lake City.....	13°	Salt Lake City.....	3°	1880	Westerville.....	13°	9 "
Vermont.....	Burlington.....	3°	Burlington.....	10°	1875	College Hill.....	2°	65 "
Virginia.....	Lynchburg.....	24°	Lynchburg.....	13°	1880	Camp Burney.....	4°	12 "
Washington T'y.....	Spokane.....	3°	Dayton.....	8°	1880	Fort Dalles.....	4°	16 "
West Virginia.....	Morgantown.....	26°	Morgantown.....	8°	1880	Franklin.....	8°	8 "
Wisconsin.....	La Crosse.....	3°	Milwaukee.....	14°	1875	Philadelphia.....	13°	113 "
Wyoming.....	Cheyenne.....	9°	Cheyenne.....	20°	1875	Allegheny Arsenal.....	4°	31 "
						Fort Adams.....	3°	40 "
						Aiken.....	23°	8 "
						Charleston.....	28°	105 "
						Clarksville.....	3°	8 "
						Fort Elliott.....	8°	3 "
						Fort Richardson.....	8°	10 "
						Co.ville.....	18°	8 "
						Newport.....	15°	8 "
						Snowville.....	9°	8 "
						Fortress Monroe.....	13°	58 "
						Fort Colville.....	8°	20 "
						Helvetia.....	0°	4 "
						Neillsville.....	26°	8 "
						Fort Crawford.....	13°	25 "
						Fort Bridger.....	40°	24 "

*Frosts.*—In the various districts they were reported on the following dates: New England, 2nd, 4th, 5th, 7th, 10th, 11th, 12th, 14th to 17th, 20th to 30th; Middle Atlantic states, 1st to 7th, 9th, 30th; South Atlantic states, 2nd, 4th, 5th, 13th, 14th, 16th, 17th, 20th, 21st, 24th to 29th; East Gulf states, 4th, 20th, 24th to 27th; West Gulf states, 3rd, 4th, 6th, 9th, 12th to 15th, 20th, 21st, 24th to 28th; Rio Grande valley, 25th; Ohio valley and Tennessee, 2nd to 6th, 9th, 10th, 12th to 17th, 19th to 30th; Lower Lake region, 1st, 2nd, 5th, 6th, 7th, 10th, 11th, 12th, 14th to 17th, 19th to 29th; Upper Lake region, 2nd to 7th, 9th to 30th; extreme Northwest, 1st to 5th, 8th to 30th; Upper Mississippi valley, 1st, 3rd to 30th; Missouri valley, 1st to 6th, 8th, 9th, 10th, 12th to 15th, 19th to 28th; Northern slope, 1st to 30th; Middle slope, 2nd to 5th, 7th to 28th, 30th; Southern slope, 3rd, 9th, 12th, 13th, 14th, 19th to 28th; Southern plateau, 1st to 30th; Middle Plateau, 1st to 4th, 7th, to 10th, 14th, 17th to 29th; Northern plateau, 1st to 30th; North Pacific coast region, 1st, 7th, 8th, 17th to 30th; Middle Pacific coast region, 7th, 8th, 11th, 12th,

15th to 26th; South Pacific coast region, 2nd to 28th, 30th. Stations in the Southern states report the occurrence of damaging frosts as follows: *North Carolina*: Wilmington, 25th, first killing frost of season, weather intensely cold, thermometer falling to 26°. Highlands, 3rd, first killing frost of season. Charlotte, 4th, first killing frost of season. *South Carolina*: Sumter, 25th, very heavy and damaging. Darlington, 25th, very heavy. Charleston, 25th, very heavy and damaging; all delicate plants left in the open air appeared as if scalded; 26th, killing frost. *Georgia*: Augusta, 24th, vegetation completely destroyed, ground froze hard and thick ice formed in places. Quitman, 25th, ice formed; vines killed. *Florida*: Pensacola, 4th, first frost of season. Mayport, 25th, first light frost of season. *Alabama*: Montgomery, 26th, first killing frost of season. Mobile, 25th, killing frost. *Mississippi*: Natchez, 4th, very heavy and destructive. *Louisiana*: New Orleans, 25th, first killing frost of the season; this damaging frost extended over nearly the whole of the state. *Texas*: Paris, 3rd, very heavy frost, seriously damaging the cotton crop; first killing frost of the season. El Paso, 10th, first killing frost of the season. Concho, 25th, killing vegetation. Uvalde, 25th, killing vegetation. Brackettville, 25th, killing vegetation. *Indian Territory*: Ft. Gibson, 20th, killing vegetation.

*Ice*.—Regarding its formation in the northern sections, this subject is considered elsewhere in the REVIEW under the head of *Ice in Rivers and Harbors*. The following are exceptional cases of ice formation in the southern portions of the country. *Arkansas*: Little Rock, 3d, 24th, 26th. *Louisiana*: New Orleans, 25th, thin ice formed on quiet water. Reports from the sugar districts say that the eyes of the cane have been killed by the hard freeze. *Maryland*: Fallston, 25th,  $\frac{1}{2}$  inch thick. *Mississippi*: Fayette, 24th,  $\frac{1}{2}$  inch; 25th,  $\frac{1}{2}$  inch. Vicksburg, 24th, first of season. *Alabama*: Montgomery, 24th, first of season; 25th. Mobile, 25th, thick ice in exposed places; 26th. *South Carolina*: Sumter, 25th, first cold day of the season, ice  $\frac{1}{2}$  inch thick in the streets. Darlington, 25th, "plenty of ice." Charleston, 25th, large quantities of ice formed in all parts of the city and remained unmelted until 10 a. m. Stateburg, 4th; 25th,  $\frac{1}{2}$  inch thick. *North Carolina*: Wilmington, 25th, ice in exposed places  $\frac{1}{2}$  inch thick. Lenoir, 16th, 17th. Weldon, 16th, first of season. *Tennessee*: Ashwood, 16th. Austin, 20th. *Texas*: Austin, 25th. Clarksville, 20th; 24th,  $\frac{1}{4}$  to  $\frac{3}{8}$  inch thick. McKavett, 24th,  $\frac{1}{4}$  inch; 25th. Fort Griffin, 19th. Brackettville, 25th,  $\frac{1}{2}$  inch, first of season. Denison, 24th. Cuero and Victoria, 24th; 25th, in exposed places. *Virginia*: Johnstown, 16th. *Indian Territory*: Fort Sill, 19th,  $\frac{1}{2}$  inch, first of season. Fort Gibson, 20th, 1 inch.

## PRECIPITATION.

The general distribution of rain-fall for the month of November, 1881, is shown on chart No. III from the reports of over 500 stations. From the table in the left-hand corner of the chart is obtained a monthly average for each of the various districts, determined from the records of Signal Service stations, added to which is a comparison of the present month with such averages for several years. A comparative examination of the rain-fall chart reveals the existence of a large area of excess embraced by the parallels of 30° and 48° N., and the meridians of 77° and 100° W. Within this extensive region the departures of excess range in the extremes from 0.35 inch in the South Atlantic states to 2.56 inches in the Lower Missouri valley. Excepting the South Atlantic states there is a continuous area of deficiency along the Atlantic coast from Florida peninsula northeastward to the Canadian Maritime provinces. On the Pacific coast there is an unbroken area of deficiency from Lower California northward to British Columbia, the departures ranging from 0.52 inch in the Middle Pacific coast region to 1.54 inches in North Pacific coast region. As a means of interesting comparison, the following maximum departures from the average are given for each year since 1872, together with the corresponding districts: 1873, large deficiency, Lower Missouri valley; 1874, +2.88 inches, North Pacific coast region and -2.00 inches Western Gulf states; 1875, +5.40 inches, Middle and North Pacific coast regions and +2.05 inches, Ohio valley and Tennessee; 1876, -2.00 inches, Ohio valley and Tennessee; 1877, +2.88 inches, Middle Atlantic states and +2.23 inches, Upper Lake region; 1878 +2.64 inches, St. Lawrence valley and -2.00 inches, Middle and North Pacific coast regions; 1879, +3.32 inches Lower Missouri valley and +2.65 inches Upper Mississippi valley; 1880, -5.33 inches, North Pacific coast region and +3.38 inches, Western Gulf states.

*Deviations from Average Precipitation*.—Under this heading departures exhibited by the reports from the regular Signal Service stations are shown in the table of comparative monthly rain-falls in the lower left hand corner of chart No. III. The following items of importance in connection with this subject are reported by voluntary observers: *Illinois*: Riley, monthly rain-fall 0.46 inch above the average for the past 20 years; autumn of the present year, wettest ever recorded, the total precipitation being 6.96 inches more than the average of this season for the past 20 years, and 2.83 inches more than the maximum for that period which occurred in 1868. *Kansas*: Lawrence, monthly rain-fall 0.49 inch above the average for the past 13 years. Yates Centre, monthly rain-fall 0.60 inch above that of 1880. Wellington, monthly rain-fall 1.11 inches above the average of the past two years. *Maine*: Gardiner, monthly rain-fall 1.19 inches below